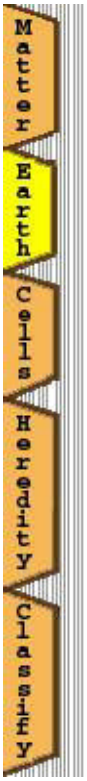


A density activity

STANDARD 3200-02 Students will compare and contrast the structure of Earth's crust and interior.
OBJECTIVE 3200-0201 Construct and defend a model of Earth's crust and interior.

Intended Learning Outcomes:

1d. Make estimations and predictions based on observations and current knowledge.
2c. Plan field studies, controlled experiments, and other investigations.
2g.Construct models and simulations to describe and explain natural phenomena.
5c. Understand science concepts and principles.

Background:
Students are able to operate a triple beam balance scale or other scale (g).
Students are able to read the meniscus of water in a graduated cylinder (mL).
Water has a density of 1.0 g/cm^3. Objects with a density greater than 1.0 will sink in water. Objects with a density less than 1.0 will float in water.

Summary:
1. Students will determine the mass and volume of a given object.
2. Students will determine the density of object by mass/volume. (g/cm^3)

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Materials:

- balance scale
- calculator
- large graduated cylinder (ml)
- pencil/paper
- water
- variety of items of different densities

Safety concerns:



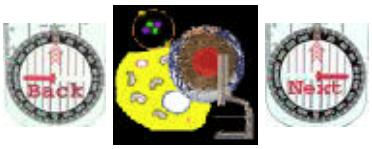
Be sure to keep all Chemical and Glassware Safety Rules that are specified by your teacher and in all general laboratory experiences, as well as all teacher directions.

Student Procedures:

1. Select one item and predict whether it will sink or float in water.
    a. Record your prediction.
2. Using the same item, determine its volume by using a graduated cylinder and water.

a. Fill the cylinder to a designated amount and record this starting point.
b. Gently drop in the item. Record the amount of water that was displaced by the item.
    i. (If the graduated cylinder is not large enough for the selected item, set a small container in a larger pan.
    ii. Completely fill the smaller container with water.
    iii. Gently drop the item into the water.
    iv. Water will spill out into the larger container.
    v. Measure this water as the amount that is displaced = volume.)

3. Using same item, determine its mass by weighing the item on balance scale. Record the mass.
4. Divide the mass by the volume to calculate the density and record the item's density.
5. Items having a density greater than1.0 g/cm^3 will sink; items having a density less than 1.0 g/cm^3 (one gram per cubic centimeter) will float.
    a. Students place items in appropriate groups as to whether they sink or float.
6. Check predictions



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